DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
PIEDMONT BRANCH
1590 ADAMSON PARKWAY, SUITE 200
MORROW, GEORGIA 30260-1777

JUL 15 2009

Regulatory Division
200800913

JOINT PUBLIC NOTICE
Savannah District/State of Georgia

The Savannah District has received an application for a Department of the Army Permit, pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), as follows:

Application Number: 200800913

Applicant: Forsyth County Water and Sewer Department
Attention: Mr. Tim Perkins
110 East Main Street, Suite 150
Cumming, Georgia 30040

Agent: CH2M Hill
Attention: Ms. Betsy Jorgensen
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, Georgia 30328

Location of Proposed Work: The proposed project is located at Latitude 34° 03' 20" North and Longitude 84° 06' 40" West, 1 mile northwest of the intersection of Peachtree Industrial Boulevard and McGinnis Ferry Road, approximately 2 miles northwest of the City of Suwanee, in Forsyth County, Georgia. Please see the attached Project Location Map of the Shakerag Water Reclamation Facility and River Diffuser (Figure 1).

Description of Work Subject to the Jurisdiction of the US Army Corps of Engineers: Forsyth County Water and Sewer Department proposes to construct a new waste treatment plant and diffuser to be known as the "Shakerag Water Reclamation Facility". The project as proposed consists of constructing a new 6 million gallon per day (mgd) water treatment plant and river diffuser, which would discharge up to 6 mgd of reuse water from the proposed Shakerag Water Reclamation Facility into the Chattahoochee River. The diffuser would be constructed of 36-inch high-density polyethylene pipe with 10 ports (6 inch diameter), each located at a spacing of 7.5 feet center to center. This pipe would be encased with square blocks of concrete (56

inches by 56 inches) for anchor and protection. The river bottom where the diffuser line would be placed would be dredged down to bedrock. The depth of sediment in this area has been surveyed at 5 feet. In addition to the concrete blocks, the diffuser line would be anchored to bedrock in the river via rebar and epoxy grout. The proposed diffuser would extend out into the riverbed approximately 100 linear feet (from the riverbank), with a dredging cut of approximately 10 feet in width. Following construction, the applicant proposes to restore the area to pre-existing contours. According to the applicant, the proposed construction activities would occur within the boundaries of a cofferdam, which has been proposed to minimize turbidity to the Chattahoochee River. Please see the attached Overall Site Plan (Figure 2) and the Plan View of the Diffuser (Figure 3) for more details regarding the location and configuration of the proposed diffuser.

According to the applicant's consultant, CH2M Hill, the effluent discharged from the proposed Shakerag Water Reclamation Facility would be polished and designed to meet the Georgia Environmental Protection Division's limit of 0.3 mg/L of Total Phosporus. In addition, CH2M Hill modeled the potential temperature impacts associated with the diffuser to the Chattahoochee River. According to CH2M Hill, the results of their models indicate that the increase in Chattahoochee River's temperature would not exceed 1.1°C within a downstream distance of 10 feet from the effluent diffuser. For more detail information on the temperature evaluation and modeling performed associated with the proposed diffuser discharge, please see the enclosed Technical Memorandum (Appendix A).

As proposed, the project will impact approximately 10 linear feet of the Chattahoochee River associated with the installation of the diffuser pipe. No other impacts are proposed associated with the construction of the Shakerag Water Treatment Plant Facility. Because the above project impacts would be temporary in nature and the diffuser construction area would be brought back to pre-existing contours, the applicant has proposed no compensatory mitigation.

Alternative Analysis: The applicant provided an alternative analysis that evaluated the practicability of offsite alternatives, onsite alternatives, and the no action alternative. Offsite alternatives included: implementation of land application system; blended reuse of reclaimed water; direct reuse of reclaimed water; a surface water discharge to Big Creek; and a surface water discharge to the Etowah River Basin. The applicant also provided an analysis of the onsite alternative (preferred alternative), along with proposed avoidance and minimization measures to further reduce project impacts.

BACKGROUND

This Joint Public Notice announces a request for authorizations from both the US Army Corps of Engineers and the State of Georgia. The applicant's proposed work may also require local governmental approval.

STATE OF GEORGIA

Water Quality Certification: The Georgia Department of Natural Resources, Environmental Protection Division, intends to certify this project at the end of 30 days in accordance with the provisions of Section 401 of the Clean Water Act, which is required by an applicant for a Federal Permit to conduct an activity in, on, or adjacent to the waters of the State of Georgia. Copies of the application and supporting documents relative to a specific application will be available for review and copying at the office of the Georgia Department of Natural Resources, Environmental Protection Division, Water Protection Branch, 4220 International Parkway, Suite 101, Atlanta, Georgia 30354, during regular office hours. A copier machine is available for public use at a charge of 25 cents per page. Any person who desires to comment, object, or request a public hearing relative to State Water Quality Certification must do so within 30 days of the State's receipt of application in writing and state the reasons or basis of objections or request for a hearing. The application can also be seen in the Savannah District US Army Corps of Engineers, Regulatory Division, Piedmont Branch, 1590 Adamson Parkway, Suite 200, Morrow, Georgia 30260.

State-owned Property and Resources: The applicant may also require assent from the State of Georgia which may be in the form of a license, easement, lease, permit, or other appropriate instrument.

US ARMY CORPS OF ENGINEERS

The Savannah District must consider the purpose and the impacts of the applicant's proposed work, prior to a decision on issuance of a Department of the Army Permit.

Cultural Resources Assessment: Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, we request the Georgia Historical Preservation Division (GAHPD) or any other interested party review the latest published version of the National Register of Historic Places (NRHP) to determine if the property has or has not any registered properties or properties listed as eligible for inclusion located at the site or in the area affected by the proposed work.

The applicant has completed a Phase I Cultural Resources Survey for this project. USACE is currently reviewing the survey report and will make an initial determination of affect in compliance with Section 106 of the National Historic Preservation Act of 1966. Following our initial determination of affect, USACE will initiate coordination with GAHPD by requesting their review and comment on the Phase I Cultural Resources Survey report and USACE's review comments.

Endangered Species: Pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), we request from the US Department of the Interior, Fish and

Wildlife Service and the US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, or any other interested party, information on whether any species listed or proposed for listing may be present in the area. USACE has made a preliminary determination that there would be no effect to threatened or endangered species.

Public Interest Review: The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and in general, the needs and welfare of the people.

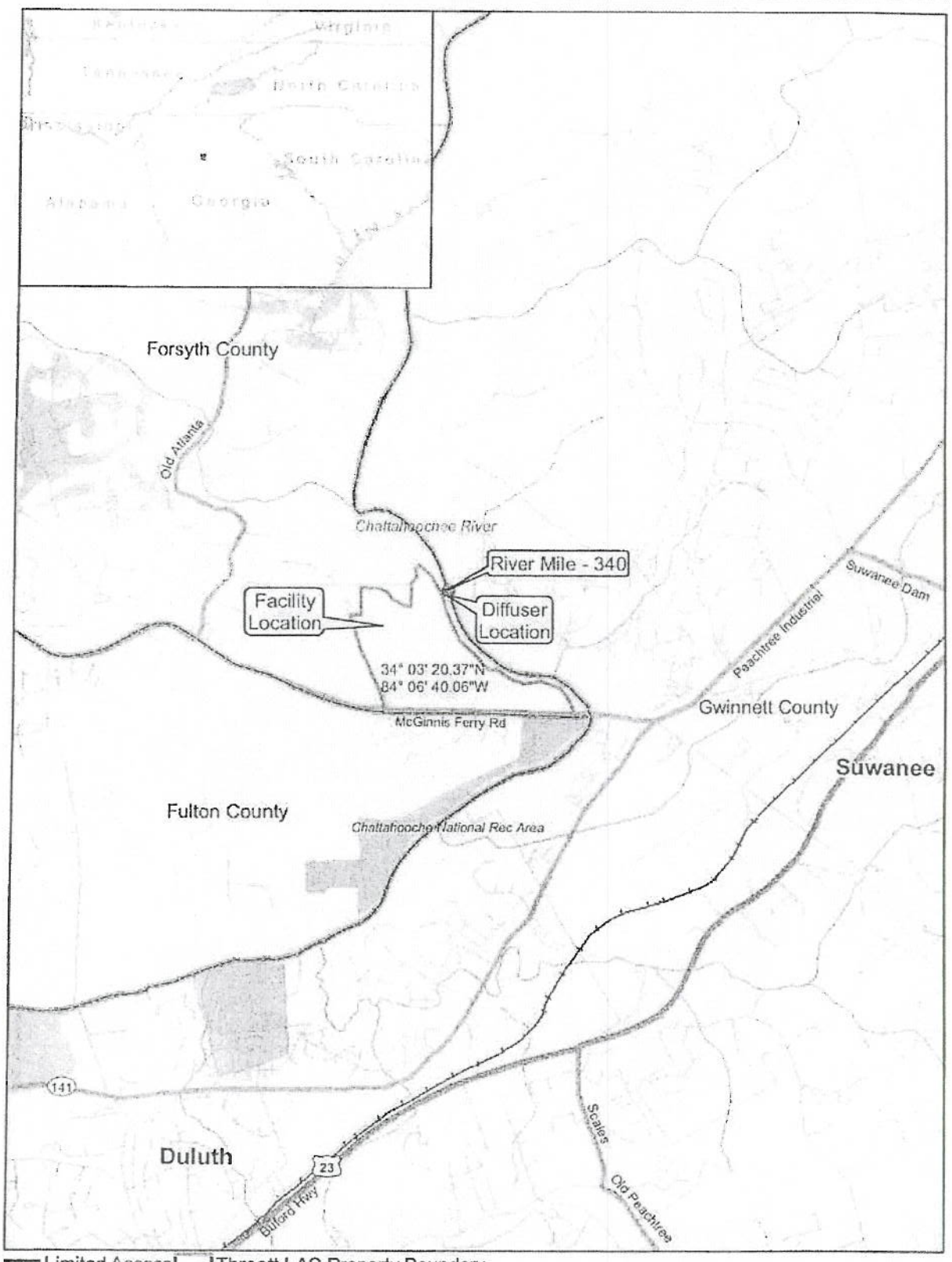
Consideration of Public Comments: The US Army Corps of Engineers is soliciting comments from the public; federal, state, and local agencies and officials; Native American Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the US Army Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Public Hearing: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application for a Department of the Army Permit. Requests for public hearings shall state, with particularity, the reasons for requesting a public hearing. The decision whether to hold a public hearing is at the discretion of the District Engineer, or his designated appointee, based on the need for additional substantial information necessary in evaluating the proposed project.

Comment Period: Anyone wishing to comment on this application for a Department of the Army Permit should submit comments in writing to the Savannah District, US Army Corps of Engineers, Piedmont Branch, Attention: Mr. Justin Hammonds, 1590 Adamson Parkway, Suite 200, Morrow, Georgia 30260-1777, no later than 30 days from the date of this notice. Please refer to the project name: Shakerag Water Reclamation Facility, USACE Project Number 200800913.

If you have any further questions concerning this matter, please contact Mr. Justin Hammonds at (770) 904-2365.

4 Enclosures
Figure 1: Project Location Map (1 page)
Figure 2: Overall Site Plan (1 page)
Figure 3: Plan View of the Diffuser (1 page)
Appendix A: Evaluation of Outfall Diffuser and Mixing of Effluent Discharged to the Chattahoochee River (11 pages)



Source: ESRI Data and Maps, 2006

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CH2MHILL

Figure 1: Project Location Map

Shakerag WRF and River Diffuser
Forsyth County, Georgia

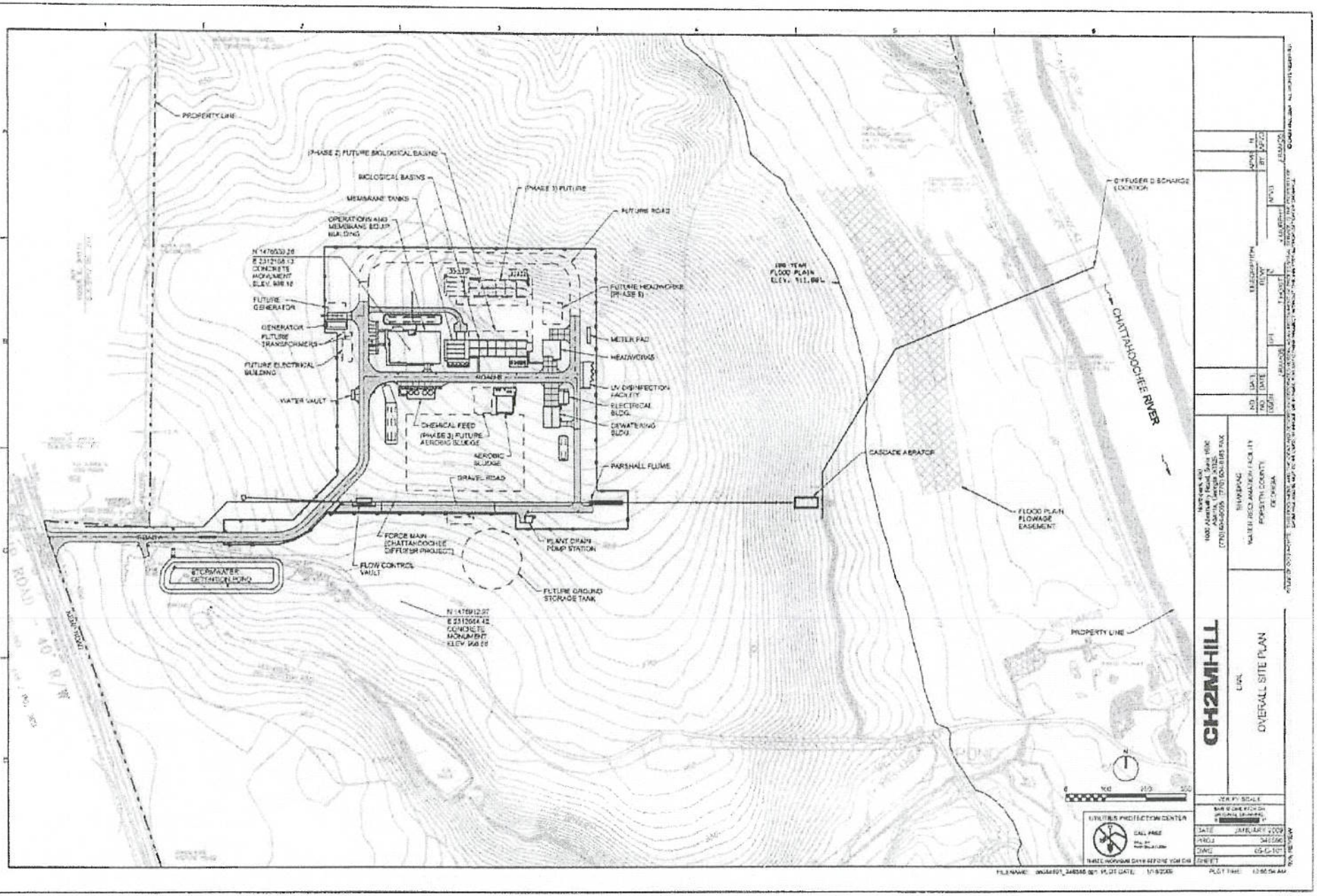
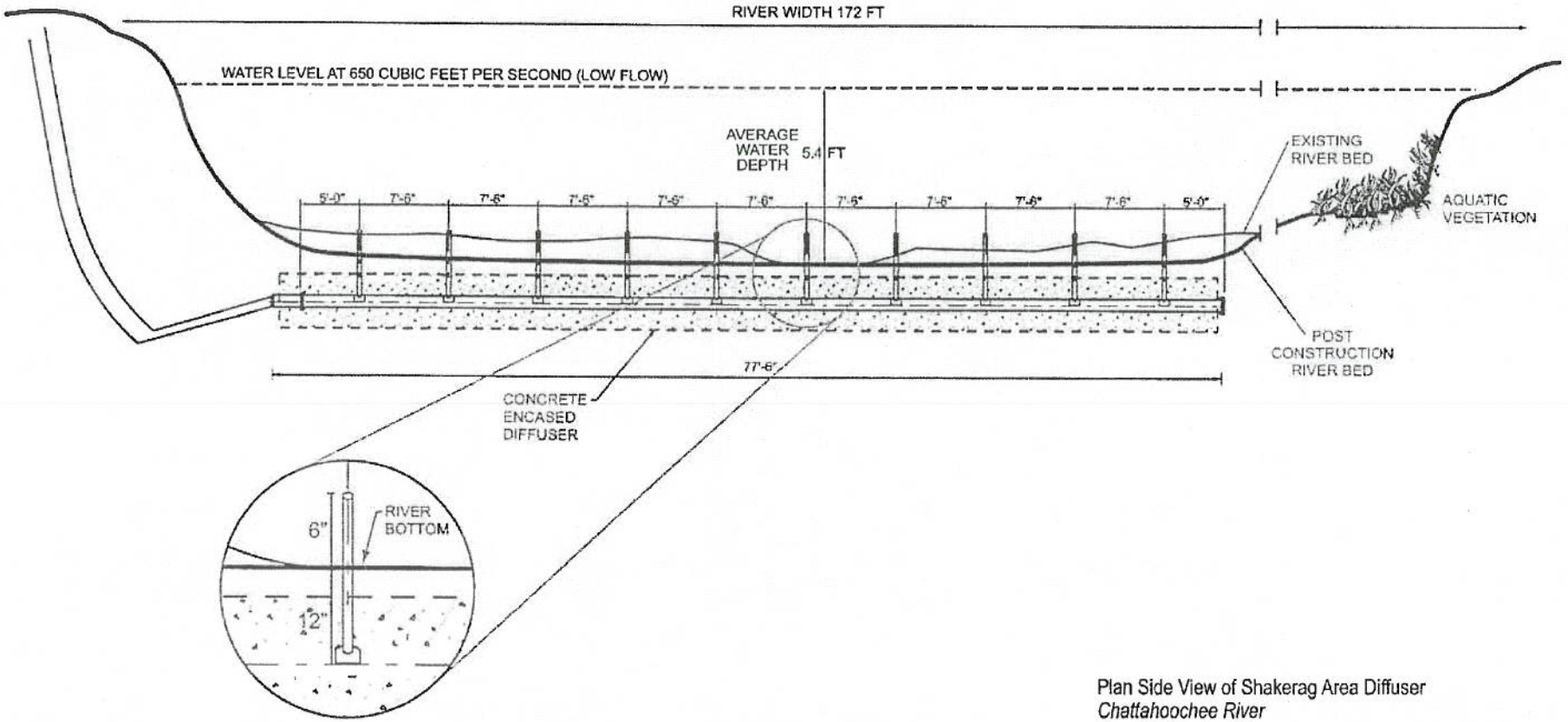


Figure 2: Overall Site Plan

Not to Scale

Conceptual Drawing. Not to be used for construction.



Plan Side View of Shakerag Area Diffuser
Chattahoochee River
Forsyth County, GA

ES082008013ATL FC113.ai

CH2MHILL

Figure 3: Plan View of the Diffuser

Appendix A:

TECHNICAL MEMORANDUM CH2MHILL

Evaluation of Outfall Diffuser and Mixing of Effluent Discharged to Chattahoochee River

PREPARED FOR: Forsyth County Water and Sewer Department

PREPARED BY: Tyagi Aditya/AUS

COPIES: Doug Baughman/ATL, Muckerman, Dave/ATL

DATE: February. 24, 2009

Objective

The objective of this technical memorandum (TM) is to evaluate the design of an outfall diffuser for a National Pollutant Discharge Elimination System (NPDES) permit application. An analysis was completed of the preliminary diffuser design (CH2M HILL, 2005) for the Environmental Information Document (EID) required by the Georgia Environmental Protection Division (GAEPD) discharge permitting process. Based on its preliminary design the effluent diffuser met the temperature standards for Chattahoochee River. However, since 2005, the final design of the diffuser was completed and the minimum stream flows in the Chattahoochee River have been reduced therefore, this TM was prepared to document the temperature impacts of the proposed discharge and diffuser under the new design and stream flow conditions.

In this TM, it has been assumed that all water quality parameters except temperature are within the permitted range of wastewater disposal characteristics and cause no water quality concerns. The Georgia Environmental Protection Division (GA EPD) has evaluated the potential effects of the proposed discharge on water quality at this general location and has issued a wasteload allocation. This allocation establishes the effluent treatment levels required to maintain downstream water quality. Thus, the main focus of this TM is the discharge of effluent through a multiport diffuser so that it would cause no adverse aquatic and river water quality impacts in the vicinity of the diffuser. The effluent would be discharged from the Forsyth County reuse system serving the Fowler Water Reclamation Facility (WRF) and two future plants.

Defining Critical Conditions for Temperature Mixing Modeling

Receiving Stream Flow

In 2008, the U.S. Army Corps of Engineers (USACE) requested that releases from Buford Dam be reduced in order to achieve a minimum flow of 650 cfs at the confluence of the Chattahoochee River with Peachtree Creek during Winter months (November through April). The goal of this reduction is to conserve critically needed storage in Lake Lanier. The revised minimum flow is 100 cfs less than the targeted summer minimum flow of 750 cfs (Table 1).

TABLE 1
Chattahoochee River Minimum Seasonal Flow for Proposed Outfall Site

Statistic	Summer (May to Oct.) (cfs)	Winter (Nov. to April Months) (cfs)
Minimum Flow (cfs)	750	650

Effluent Flow

The proposed diffuser would discharge effluent from Forsyth County's reuse force main. The 11-mile supply line transects the southern part of the county, beginning at the Fowler WRF, collecting treated effluent from the James Creek WRF (under construction) and terminating at the Threatt Land Application Site on McGinnis Ferry Road. The Fowler and James WRFs are membrane bioreactor (MBR) plants, permitted to treat to urban reuse standards as established by the GA EPD. The maximum month average daily effluent flow, peak daily flow, and peak hour flows are provided in Table 2.

TABLE 2
Effluent Discharge

Item	Maximum Month Average Daily Flow (mgd)	Peak Daily Flow (mgd)	Peak Hour Flow (mgd)
Effluent (cfs)	6.0	9.6	14.4

Temperature of Receiving Stream and Discharged Effluent

Based on previous analysis (CH2M HILL 2005) of historical temperature data for the Chattahoochee River near the proposed outfall site, average summer and winter temperatures are shown in Table 3.

Additionally, based on the effluent temperature data measured at the Fowler WRF from June 2004 to February 2005, the average and 90th percentile temperature values for both summer and winter are also given in Table 3.

TABLE 3
Temperature Characteristics of Receiving Stream and Plant Effluent

Item	Effluent Temperature (°C)		Chattahoochee River Temperature (°C)	
	Average Daily	90th percentile	Average Daily	90th percentile
Summer	24.0	26.6	11.40	13.73
Winter	20.0	23.0	09.69	12.39

Cross-Sectional Area and Hydraulic Conditions of Receiving Stream

Stream cross-sectional information such as water depth and velocity is needed to model mixing and review the results for vertical and lateral spreading. Ambient stream velocity greatly influences both the dynamics and shape of a plume, so diffuser performance is very sensitive to stream ambient velocity. The velocity that corresponds to the critical flows needs to be determined. In order to determine the critical ambient velocities, a HEC-RAS model was developed using surveyed cross-sectional information (CH2M HILL 2008). The developed HEC-RAS model was used to determine the water depth and stream velocity corresponding to the summer and winter minimum flows as characterized in the preceding section. The cross-sectional data for the Chattahoochee River at three locations in a 1-mile stream segment (Figure 1) are presented in Figure 2.

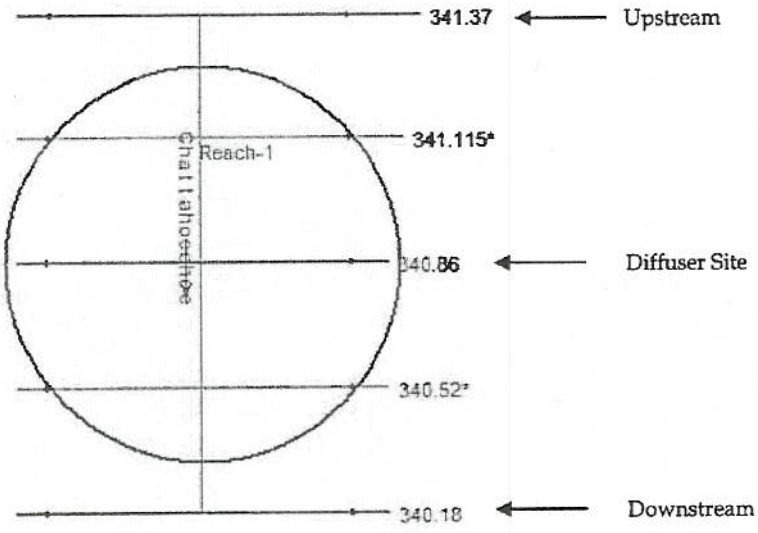


FIGURE 1
Chattahoochee River Cross-Sections Locations: Outfall Site, Upstream, Downstream, and Mid-Points

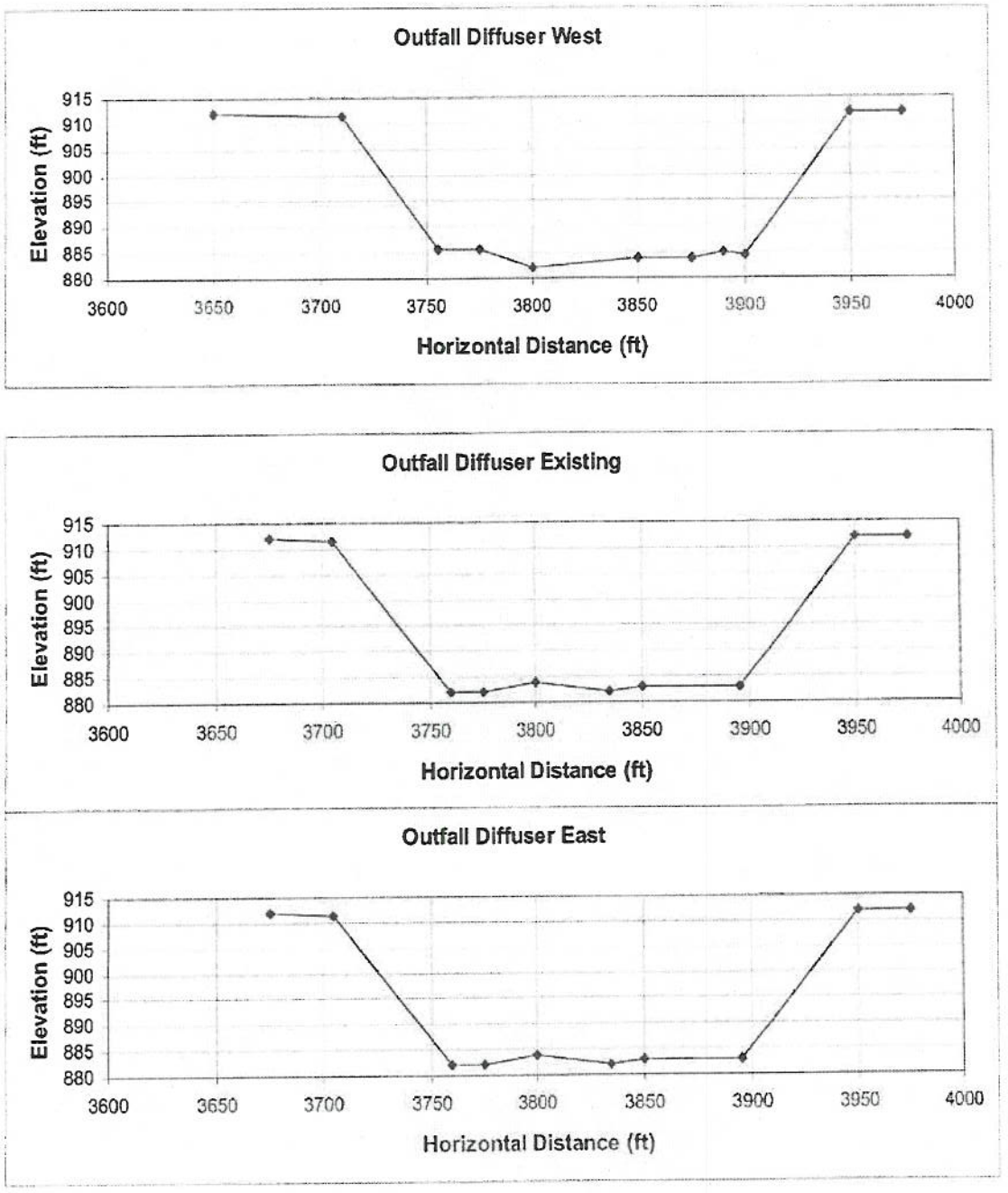


FIGURE 2
Chattahoochee River Cross-Sectional Data at Outfall Site and Upstream and Downstream Locations

The HEC-RAS model results based on the channel roughness, surveyed slope data, and downstream subcritical boundary condition during minimum seasonal flows are presented in Table 4. Figure 3 presents the resulted profiles under the minimum flow conditions for both summer and winter seasons.

TABLE 4

HEC-RAS Results Corresponding to Minimum Seasonal Flow Rates in Chattahoochee River

River Station	Q Total (cfs)	Min Ch Elev (ft)	W.S. Elev (ft)	Avg. Water Depth (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
Winter Min. Flow (650 cfs) Profile									
341.37	650	882	887.24	5.24	887.27	7.21E-04	1.33	490.42	152.99
341.115	650	881.75	887.18	5.43	887.21	4.94E-04	1.19	546.59	151.59
340.86	664.85	881.75	887.15	5.4	887.17	2.59E-04	0.98	681.05	155.35
340.52	664.85	881.75	887.11	5.36	887.13	4.57E-04	1.23	540.4	133.92
340.18	664.85	882	887.07	5.07	887.09	3.60E-04	1.09	612.26	152.19
Summer Min. Flow (750 cfs) Profile									
341.37	750	882	887.61	5.61	887.64	6.75E-04	1.37	546.96	154.3
341.115	750	881.75	887.55	5.8	887.58	4.85E-04	1.24	603.17	154.07
340.86	764.85	881.75	887.52	5.77	887.54	2.65E-04	1.04	738.8	156.71
340.52	764.85	881.75	887.48	5.73	887.51	4.65E-04	1.3	590.34	136.98
340.18	764.85	882	887.44	5.44	887.46	3.60E-04	1.14	668.65	153.57

Q = Flow (cfs)
Ch. Elev = Channel Elevation (ft)
W. S. Elev = Water Surface Elevation (ft)
E.G. Elev = Energy Gradient Elevation (ft)
Vel Chanl = Channel Velocity (ft./sec)

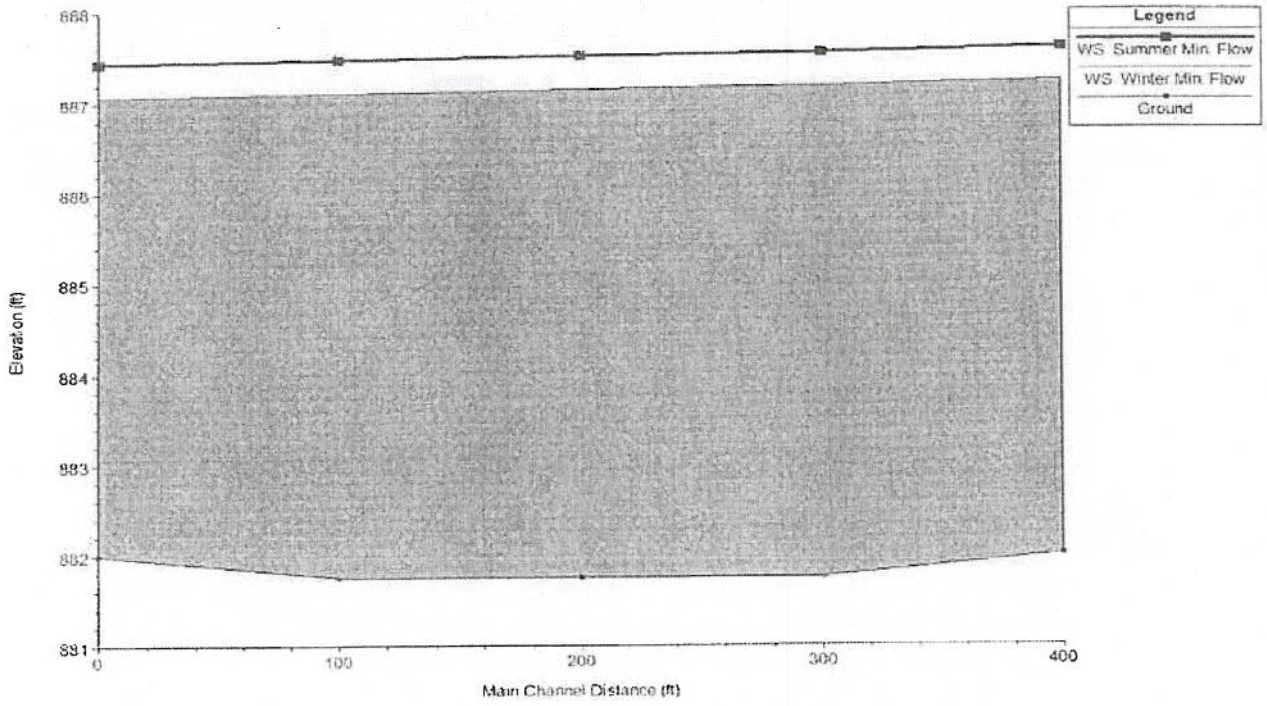
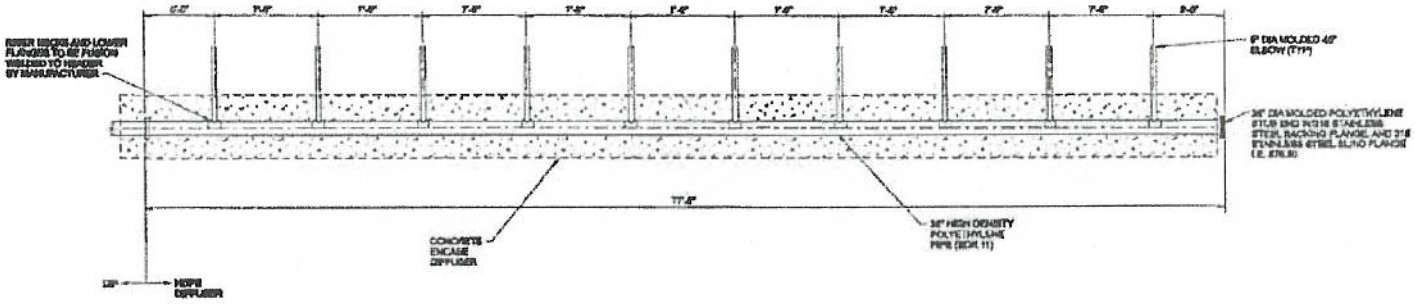
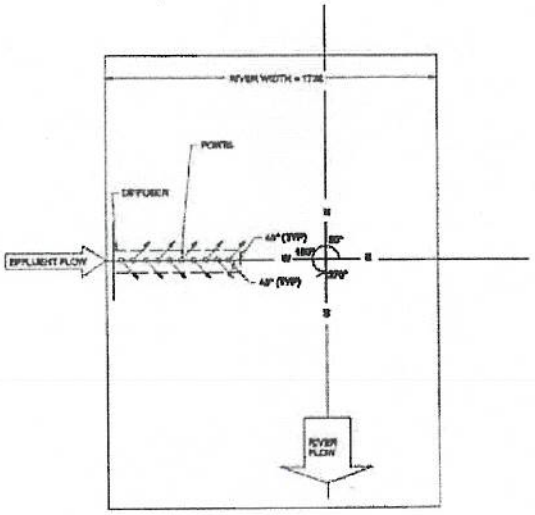


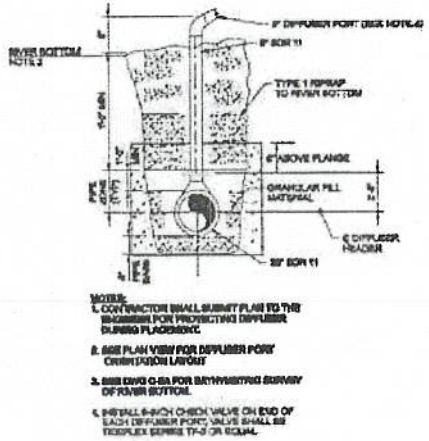
FIGURE 3

Chattahoochee River Profile Plot for the Outfall Location and its vicinity Cross-sectios as defined in Figure 1





DIFFUSER PORT ORIENTATION LAYOUT



DIFFUSER TRENCH AND RISER DETAIL

FIGURE 4
Schematic of Diffuser

Design of Outfall Diffuser

To design the multiport diffuser, the Visual Plumes (VP) model (Frick et al., 2001) was selected. VP was also used to model the dispersion of effluent discharged through the submerged diffuser at the outfall site.

Diffuser Alignment and Port Characteristics

For a submerged multiport outfall diffuser, the direction of the ambient current relative to the discharge ports is one of many important factors that determine the mixing performance of the existing diffuser in the near-field region. In this case, the diffuser is aligned perpendicular to channel flow. The diffuser includes 10 ports, each located at a spacing of 7.5 feet center to center. The upward vertical angles for the odd and even ports are 45 degrees from horizontal. Figure 4 provides schematic drawings of the diffuser and its orientation.

Model Input

The input required for modeling dilution and plume behavior includes the receiving stream hydraulic parameters, effluent characteristics, diffuser port number and orientation relative to flow, and diffuser physical parameters. To prepare the input data, several preliminary model runs were performed assuming various combinations of port diameter, port spacing, port length, vertical and horizontal angles, etc. The results were analyzed for exit discharge velocity, diffuser length that is suitable for the outfall site, port diameter, number and spacing of ports, and overall diffuser performance. Based on the preliminary diffuser modeling analysis, the following diffuser parameters were selected:

- Depth of water under minimum flow conditions = 5-6 feet (see Table 4 or Figure 3)
- River width = 172 feet
- Diffuser length = 77.5 feet
- Number of ports = 10
- Port diameter = 6 inches
- Spacing of ports = 7.5 feet center to center
- Vertical port angle (relative to horizontal) = 45 degrees
- Angle of diffuser axis relative to ambient current direction = 270 degrees
- Port elevation above riverbed = 6 inches

The performance of the multiport diffuser was evaluated based on the following criteria:

(1) The elevation in temperature above ambient river temperature; the maximum allowed temperature increase is 1.10°C within a plume.

(2) Downstream distance affected by temperature elevation should be minimum.

(3) Downstream distance from the diffuser to the point where individual plumes merge, reach water surface, or contact riverbed.

Modeling Results and Analysis

A detailed analysis was performed using the above diffuser parameters. The performance of the multiport diffuser was analyzed relative to winter and summer critical conditions for various effluent flow rates namely maximum month average daily flow of 6 mgd, peak daily flow of 9.6 mgd, and peak hourly flow of 14.4 mgd. The modeling results of the diffuser under the winter and summer scenarios are presented graphically in Figures 5 and 6, respectively. These results are also summarized in Tables 5 and 6.

In general, increasing the effluent velocity increases the initial mixing; as a result, the plumes reach the targeted temperature (i.e. within 1.1°C of ambient) at a shorter distance from the diffuser. It was observed that individual plumes do not merge except in the case of effluent discharge of 14.4 mgd. In this case however, the plume merging takes place about 4.8 ft away from the diffuser. It can be seen from Figures 5 and 6 that for the 14.4 mgd case, the plumes reach in the allowed temperature zone in a distance shorter than 4.8 ft. Therefore results are not affected by the plume merging.

Further, it can be noticed from Figures 5 and 6 that for all the cases plumes are well within 10 feet of the diffuser. Thus, it is concluded that the receiving water temperature difference produced by plumes discharged at rates of 6 mgd, 9.6 mgd, and 14.4 mgd would be within 1.1 degree Celsius of ambient temperature within a distance of 10 feet downstream of the diffuser.

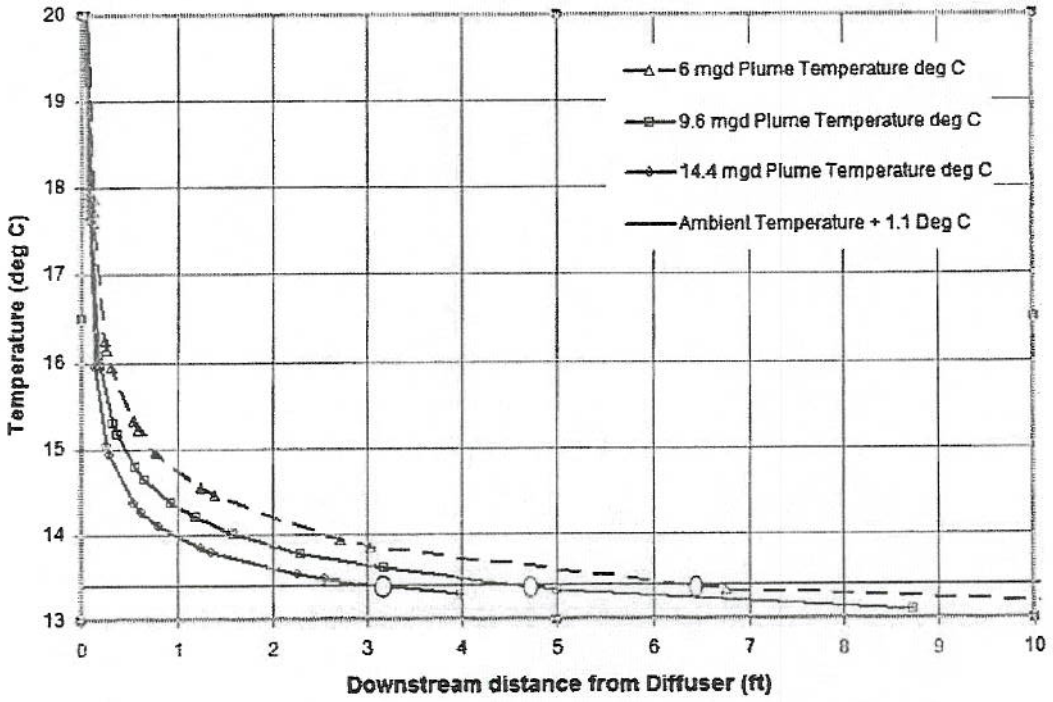


FIGURE 5
Plume Temperature as Function of Distance from Diffuser Under Winter Critical Conditions

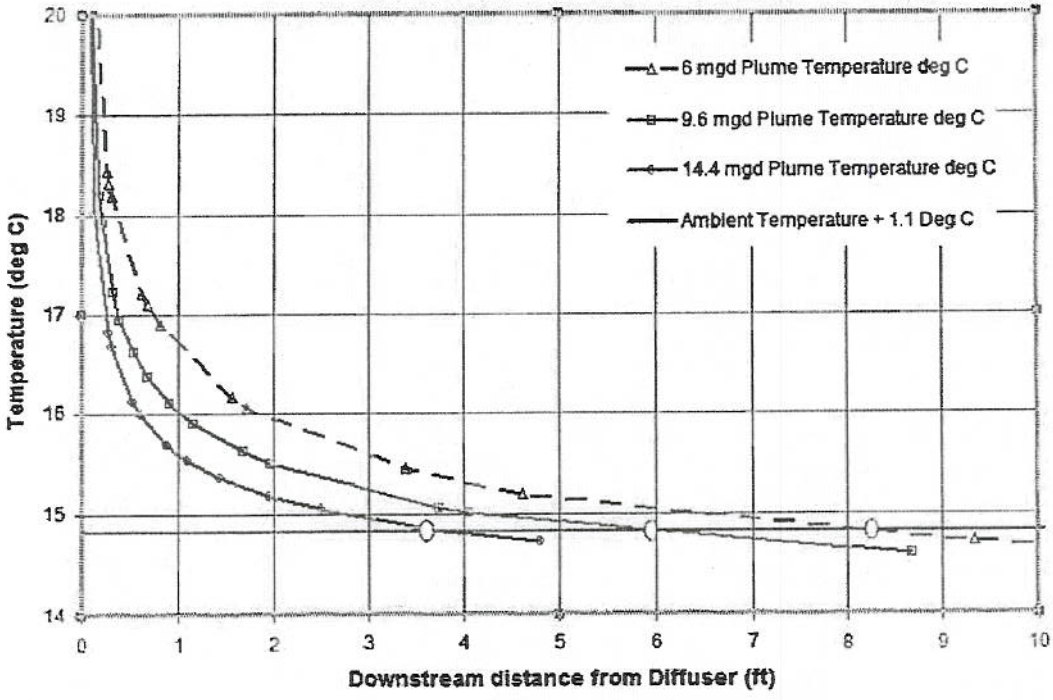


FIGURE 6
Plume Temperature as Function of Distance from Diffuser Under Summer Critical Conditions

TABLE 5

Summary of Hydrodynamic Mixing Results Given Winter Critical Conditions

Resulting Mixing Characteristic at the End of Initial Mixing Zone

6 MGD Discharge		9.6 MGD Discharge		14.4 MGD Discharge	
Distance (ft)	Plume Temperature (°C)	Distance (ft)	Plume Temperature (°C)	Distance (ft)	Plume Temperature (°C)
0	23.00	0	23.00	0	23.00
0.13	17.88	0.10	17.88	0.07	17.89
0.13	17.74	0.10	17.75	0.07	17.77
0.14	17.61	0.10	17.62	0.08	17.65
0.25	16.24	0.19	16.06	0.14	15.93
0.27	16.13	0.20	15.95	0.26	15.04
0.31	15.94	0.33	15.28	0.29	14.92
0.54	15.32	0.37	15.15	0.54	14.36
0.60	15.22	0.55	14.78	0.62	14.26
0.78	14.96	0.66	14.63	0.81	14.08
1.25	14.54	0.95	14.36	1.25	13.83
1.39	14.45	1.20	14.19	1.37	13.78
2.72	13.92	1.59	14.00	2.27	13.53
3.02	13.85	2.30	13.77	2.54	13.48
6.75	13.35	3.18	13.59	3.98	13.29
14.35	13.02	5.00	13.35	3.98	13.29
15.62	12.99	8.74	13.11		
16.89	12.96	9.37	13.09		
19.44	12.92				

ΔT Criteria: Receiving Water Temperature in Winter Critical Condition ≤ 13.39 ^{0}C

TABLE 6

Summary of Hydrodynamic Mixing Results Given Summer Critical Conditions

Resulting Mixing Characteristic at the End of Initial Mixing Zone					
6 MGD Discharge		9.6 MGD Discharge		14.4 MGD Discharge	
Distance (ft)	Plume Temperature (°C)	Distance (ft)	Plume Temperature (°C)	Distance (ft)	Plume Temperature (°C)
0	26.6	0	26.6	0	26.6
0.13	20.37	0.09	20.39	0.07	20.39
0.14	20.21	0.10	20.23	0.07	20.25
0.14	20.05	0.10	20.07	0.07	20.12
0.27	18.43	0.18	18.18	0.14	18.03
0.29	18.3	0.21	17.92	0.28	16.81
0.31	18.18	0.32	17.22	0.31	16.68
0.63	17.20	0.40	16.94	0.52	16.12
0.69	17.09	0.54	16.61	0.60	15.99
0.82	16.89	0.69	16.36	0.89	15.68
1.58	16.16	0.92	16.10	1.10	15.53
1.73	16.07	1.17	15.9	1.45	15.35
3.38	15.44	1.70	15.61	1.95	15.17
4.62	15.18	1.98	15.49	2.49	15.04
9.34	14.72	3.74	15.05	3.63	14.84
15.68	14.46	4.04	15.01	4.81	14.72
16.96	14.43	8.69	14.59		
19.50	14.37	11.21	14.49		
24.60	14.29				

ΔT Criteria:

Receiving Water Temperature in Summer Critical Condition ≤ 14.83 °C

Summary and Conclusions

Modeling runs were completed using the seasonal critical flow and temperature conditions for the proposed outfall location on the Chattahoochee River. Results of the modeling indicate that the increase in temperature would not exceeed 1.1 °C within a downstream distance of 10 feet from the diffuser using any of three different discharge rates: 6 mgd, 9.6 mgd, and 14.4 mgd.